

## REMARKS

Claims 1-18 are pending in the present application. No claims are amended or canceled in this submission.

Pursuant to MPEP § 706.07(c), Applicant respectfully requests that the final rejection of the present application be withdrawn as premature. Specifically, in the Final Action dated December 30, 2005, the Examiner failed to acknowledge or respond to the substantive arguments presented by the Applicant in the response filed on November 18, 2005. In addition, the final rejection of the claims was based on a reference (Wright) that had not previously been cited or applied by the Examiner.

Without any indication that the Examiner considered the substance of the arguments set forth in Applicant's reply, it cannot be properly concluded that the Applicant has received a full and fair hearing or that a clear issue has been developed between the Examiner and the Applicant prior to appeal. Moreover, the MPEP repeatedly stresses the importance of answering an applicant's arguments. See MPEP §707.07(f) "The importance of answering applicant's arguments is illustrated by *In re Herrmann*, 261 F.2d 598, 120 USPQ 182 (CCPA 1958); *In re Soni*, 54 F.3d 746, 751, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995)(Office failed to rebut applicant's argument); "Examiner Note: The Examiner must address all arguments which have not already been responded to in the statement of rejection."; MPEP § 706.07 ("a final rejection may refer to [a single previous Office Action which contains a complete statement of a ground of rejection] and also should include a rebuttal of any arguments raised in the applicant's reply"). Answering the substance of an applicant's argument is also required where an applicant traverses a rejection and the Examiner repeats the rejection. MPEP § 707.07(f).

For the foregoing reasons, the Applicant respectfully requests that the finality of the rejection of the last Office action be withdrawn. However, in compliance with 37

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CFR 1.113, a full and complete response to the Final action is contained in this submission.

Claims 1-18 stand "finally" rejected under 35 USC § 103(a) as being unpatentable over Wright (US 3,852,999) in view of Hansen (US 6,624,539).

As required by MPEP 2143 *et seq.* to establish a prima facie case of obviousness, three basic criteria must be met:

- (1) There must be some suggestion or motivation to modify or combine the teachings of the references;
- (2) There must be some expectation of success;
- (3) The references when combined must teach or suggest all the claim limitations.

As discussed below, Applicant respectfully disagrees with the Examiner's assertion that the present invention is made obvious in light of the teachings of Wright in view of Hansen. Instead, the suggested combination of references is improper because there is no motivation for combining the teachings of Hansen with Wright, nor is there an expectation of success in doing so. Specifically, an analysis of the reference teachings makes it apparent that the proposed combination would not work. Lastly, the combination fails to teach or suggest all of the claim limitations of the present invention. Because the Examiner has failed to establish the prima facie case of obviousness, the rejection should be withdrawn.

Claim 1 recites:

A bonding apparatus for a wire bonding machine comprising:  
a bonding tool coupled to an ultrasonic transducer , said transducer comprising:

a giant magnetostrictive element,  
a fastener for holding the giant magnetostrictive element  
under mechanical pressure,  
a first field generator for providing a magnetic bias field,  
a second field generator for providing a magnetic drive field,  
and  
a magnetic circuit for channelling the magnetic fields in the  
giant magnetostrictive element.

Claim 10 recites:

A bonding apparatus for a wire bonding machine comprising:  
a horn having a bonding tool at a smaller end and a mounting  
collar at an opposite end, and  
an ultrasonic transducer coupled to the horn and comprising a giant  
magnetostrictive element, a fastener for holding the giant  
magnetostrictive element under mechanical pressure, a first field  
generator for providing a magnetic bias field, a second field generator for  
providing a magnetic drive field, and a magnetic circuit for channelling the  
magnetic fields in the giant magnetostrictive element.

As described in the specification, traditional piezoelectric ultrasonic transducers suffer from accelerated aging and failure rate when used in high-powered applications. To this end, Applicant's configuration of a horn having a bonding tool at the smaller end and a mounting collar on the opposite end avoids energy loss and degradation of the bonding performance. In addition to the configuration recited in claims 1 and 10, the ultrasonic transducer of the present invention further employs a magnetostrictive element comprised of rare-earth alloy based materials to achieve improved power-handling capabilities, efficiency and reliability in wire bonding applications.

As discussed in the previous Office action response, Hansen discloses a high power transducer for general-purpose applications. Wright, however, is directed to a device for sensing impedance changes in an ultrasonic circuit. In Wright, the impedance-measuring device is noted as having general application and it is merely for the purpose of illustration that the device is described in the context of ultrasonic wire bonding. Thus, while Wright may disclose an ultrasonic transducer, it is ancillary to the

main teachings of the reference. Furthermore, because there are no problems with the ultrasonic transducer in the illustrative application, there would be no motivation for a skilled practitioner to improve or modify it. More importantly, Wright does not supply or suggest a motivation or the desirability of modifying its teachings in the way suggested by the Examiner. The fact that reference teachings can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. MPEP 2143.01 *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Because the combination of references fail to disclose or suggest a motivation to combine the reference invention to arrive at the invention of the present application, the Examiner's obviousness rejection should be withdrawn.

Nevertheless, even if a skilled practitioner had some external reason to find an alternative transducer for the apparatus disclosed in Wright, the transducer structure of Hansen is incompatible with the Wright device because there is no teaching or suggestion that Hansen's transducer can reach ultrasonic operational frequencies which, by definition, are greater than 20kHz. Specifically, a skilled practitioner would not expect Hansen's device to function in the ultrasonic frequency range because Hansen only discloses the use of alloys, which have a very high electrical conductivity. High electrical conductivity leads to high eddy-current losses and large temperature increases. Current loss and overheating would increase significantly as operational frequency increased, which in turn would significantly decrease the efficiency and longevity of the device. As a result, the operational frequencies and operational bandwidths would have to be limited to a few kilohertz in keeping with the capabilities of the alloy materials. Because of the apparent inability of the Hansen device to operate in a true ultrasonic range, the skilled practitioner would not be motivated nor would he or she succeed in modifying Wright with the teachings of Hansen. Without an expectation of success in combining the reference teachings, the proposed combination is improper and the obviousness rejection should be withdrawn.

Claims 2-9 depend on claim 1 and are patentable for at least the same reasons set forth in support of claim 1. Claims 11-18 depend on claim 10 and are patentable for at least the same reasons set forth in support of claim 10.

Finally, the proposed combination of Wright and Hansen fails to teach or suggest all of the limitations of the present invention as claimed. Even if the suggested combination discloses the claimed structure as the Examiner contends, the references still fail to disclose, teach, or suggest a magnetostrictive element comprised of "two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material." This feature is recited in claims 5 and 14.

The Examiner has previously admitted that Hansen did not specifically disclose a magnetostrictive material comprised of two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material. However, in the Final Action, the Examiner failed to point out where this limitation was disclosed or suggested in Wright. Without more, the combination fails to teach or suggest all of the claim limitations.

Regardless of the Examiner's unsupported contention that selection from known materials is within the skill expected of the routineer, the Examiner provides no technical reasoning or explanation that would lead the routineer to choose a magnetostrictive material comprised of two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material. The burden is on the Examiner to "present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." MPEP § 2143; *Ex parte Clapp*, 277 USPQ 972, 973 (BPAI 1985). See also *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988)(reversing the examiner and the Board). *In re Fine* makes clear that it is not enough for the Examiner to state that modifications of the prior art to meet the claimed invention were within the ordinary skill of the art without providing support or explanation for this conclusion.

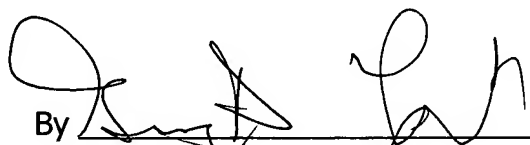
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Because the references, either alone or in combination, fail to teach or suggest all of the limitations as claimed, the proposed combination is improper and the obviousness rejection should be withdrawn.

**For all the foregoing reasons**, allowance of claims 1-18 is respectfully requested.

Respectfully submitted,

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